

What is claimed is:

1. A projection display device comprising:

5 a light source array including a plurality of light emitting diode element arrays, each said light emitting diode element array being composed of a plurality of light emitting diode elements as a light source for generating light flux;

10 an illumination optical system including a pair of a first fly-eye lens and a second fly-eye lens, said first and second fly-eye lenses having the same optical axis;

a two-dimensional light modulator illuminated by said illumination optical system for modulating image light;

a projection lens for enlarging and projecting the modulated image light onto a screen; and

15 a light source array moving mechanism for reciprocating an entirety of said light source array within a plane perpendicular to the optical axis of said first fly-eye lens.

2. The projection display device according to claim 1, wherein:

20 each of said first and second fly-eye lenses comprises a plurality of rectangular elemental lenses assembled in an array form, said elemental lenses being identical in quantity to said light emitting diode element arrays; and

25 a light emitting diode element within said light emitting diode element array of said light source array is turned on when a center of said light emitting diode element substantially aligns with the optical axis of an

elemental lens of said first fly-eye lens closer to said light source array, and said light emitting diode element is turned off when the center thereof is not substantially in alignment with the optical axis.

5 3. A projection display device comprising:

 a light source array including a plurality of light emitting diode element arrays, each said light emitting diode element array being composed of a plurality of light emitting diode elements as a light source for generating light flux;

10 an illumination optical system including a pair of a first fly-eye lens and a second fly-eye lens, said first and second fly-eye lenses having the same optical axis, each of said first and second fly-eye lenses including a plurality of rectangular elemental lenses assembled in an array form, said elemental lenses being identical in quantity to said light emitting diode
15 element arrays;

 a two-dimensional light modulator illuminated by said illumination optical system for modulating image light;

 a projection lens for enlarging and projecting the modulated image light onto a screen;

20 a light source array moving mechanism for reciprocating an entirety of said light source array within a plane perpendicular to the optical axis of said first fly-eye lens, such that a light emitting diode element within said light emitting diode element array of said light source array is turned on when a center of said light emitting diode element substantially aligns with
25 the optical axis of an elemental lens of said first fly-eye lens closer to said light source array, and said light emitting diode element is turned off when

the center thereof is not substantially in alignment with the optical axis; and
control means for controlling to turn on/off each of said light
emitting diode elements within said light emitting diode element arrays.

5 4. A projection display device comprising:

three light source arrays independent of one another and
associated with R, B, G colors, respectively, each said light source array
including a plurality of light emitting diode element arrays, each said light
emitting diode element array being composed of a plurality of light emitting
10 diode elements;

an illumination optical system including first fly-eye lenses
connected to said three light source arrays, respectively, a cross dichroic
prism for combining light flux formed by said three light source arrays
through said first fly-eye lenses associated therewith, and a second fly-eye
15 lens, each of said first fly-eye lenses and said second fly-eye lens including a
plurality of rectangular elemental lenses assembled in an array form, said
elemental lenses being identical in quantity to said light emitting diode
element arrays;

a two-dimensional light modulator illuminated by said illumination
20 optical system for modulating image light;

a projection lens for enlarging and projecting the modulated image
light onto a screen;

three light source array moving mechanisms associated with said
three light source arrays, respectively, each for reciprocating one of said light
25 source arrays associated therewith within a plane perpendicular to an optical
axis of said first fly-eye lens associated therewith, such that a light emitting

diode element within said light emitting diode element array in each of said three light source arrays is turned on when the center of said light emitting diode element substantially aligns with the optical axis of an elemental lens of said first fly-eye lens closer to each of said three light source arrays, and
5 said light emitting diode element is turned off when the center thereof is not substantially in alignment with the optical axis; and

control means for controlling to turn on/off each of said light emitting diode elements within said light emitting diode element arrays in said three light source arrays.

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5. The projection display device according to claim 1, wherein each said light emitting diode element array comprises three or more light emitting diode elements.

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6. The projection display device according to claim 2, wherein each said light emitting diode element array comprises three or more light emitting diode elements.

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7. The projection display device according to claim 3, wherein each said light emitting diode element array comprises three or more light emitting diode elements.

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8. The projection display device according to claim 5, wherein each said light emitting diode element array comprises three light emitting diode elements which emit light in red, blue, and green, respectively.

9. The projection display device according to claim 6, wherein each said light emitting diode element array comprises three light emitting diode elements which emit light in red, blue, and green, respectively.

5 10. The projection display device according to claim 7, wherein each said light emitting diode element array comprises three light emitting diode elements which emit light in red, blue, and green, respectively.

10 11. The projection display device according to claim 5, wherein each said light emitting diode element array comprises three light emitting diode elements which emit light in a same color.

12. The projection display device according to claim 6, wherein each said light emitting diode element array comprises three light emitting diode
15 elements which emit light in a same color.

13. The projection display device according to claim 7, wherein each said light emitting diode element array comprises three light emitting diode elements which emit light in a same color.

20 14. The projection display device according to claim 5, wherein each said light emitting diode element array comprises more than three light emitting diode elements, three of which are light emitting diode elements that emit light in red, blue, and green, respectively, and the rest of which are light
25 emitting diode elements selected from light emitting diode elements that emit light in red, blue, and green.

15. The projection display device according to claim 6, wherein each
said light emitting diode element array comprises more than three light
emitting diode elements, three of which are light emitting diode elements that
5 emit light in red, blue, and green, respectively, and the rest of which are light
emitting diode elements selected from light emitting diode elements that emit
light in red, blue, and green.

16. The projection display device according to claim 7, wherein each
10 said light emitting diode element array comprises more than three light
emitting diode elements, three of which are light emitting diode elements that
emit light in red, blue, and green, respectively, and the rest of which are light
emitting diode elements selected from light emitting diode elements that emit
light in red, blue, and green.

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17. The projection display device according to claim 5, wherein each
said light emitting diode element array comprises more than three light
emitting diode elements, wherein said light emitting diode elements in
excess of three are light emitting diode elements that emit light in the same
20 color.

18. The projection display device according to claim 6, wherein each
said light emitting diode element array comprises more than three light
emitting diode elements, wherein said light emitting diode elements in
25 excess of three are light emitting diode elements that emit light in the same
color.

19. The projection display device according to claim 7, wherein each said light emitting diode element array comprises more than three light emitting diode elements, wherein said light emitting diode elements in excess of three are light emitting diode elements that emit light in the same color.

20. The projection display device according to claim 4, wherein:
each said light emitting diode element array comprises three or more light emitting diode elements;

said light emitting diode elements making up said light emitting diode element array forming part of said light source array associated with R color comprise light emitting diodes, all of which emit light in red;

said light emitting diode elements making up said light emitting diode element array forming part of said light source array associated with B color comprise light emitting diodes, all of which emit light in blue; and

said light emitting diode elements making up said light emitting diode element array forming part of said light source array associated with G color comprise light emitting diodes, all of which emit light in green.